

Centre No.						Paper Reference						Surname	Initial(s)	
Candidate No.						1	3	8	0	/	4	H	Signature	

Paper Reference(s)

1380/4H

Edexcel GCSE

Mathematics (Linear) – 1380

Paper 4 (Calculator)

Quadratic Equations

Past Paper Questions

Arranged by Topic

Model Answers

Materials required for examination

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Items included with question papers

Nil

Examiner's use only

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Team Leader's use only

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Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.

Check that you have the correct question paper.

Answer ALL the questions. Write your answers in the spaces provided in this question paper.

You must NOT write on the formulae page.

Anything you write on the formulae page will gain NO credit.

If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

There are 26 questions in this question paper. The total mark for this paper is 100.

There are 24 pages in this question paper. Any blank pages are indicated.

Calculators may be used.

If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Advice to Candidates

Show all stages in any calculations.

Work steadily through the paper. Do not spend too long on one question.

If you cannot answer a question, leave it and attempt the next one.

Return at the end to those you have left out.

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Compiled by Peter Bland

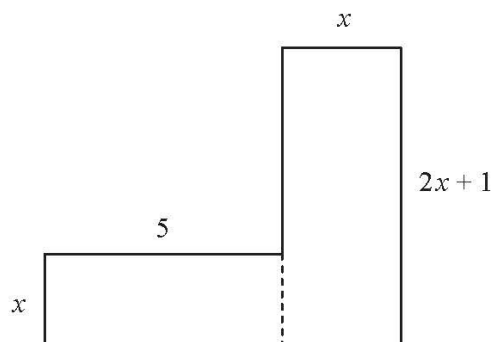


Turn over

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1. The diagram below shows a 6-sided shape.
All the corners are right angles.
All the measurements are given in centimetres.

Diagram **NOT**
accurately drawn



The area of the shape is 95 cm^2 .

- (a) Show that $2x^2 + 6x - 95 = 0$

$$x(2x + 1) + 5x = 95$$

$$2x^2 + x + 5x = 95$$

$$2x^2 + 6x - 95 = 0$$

(3)

- (b) Solve the equation

$$2x^2 + 6x - 95 = 0$$

Give your solutions correct to 3 significant figures.

$$x = \frac{-6 \pm \sqrt{6^2 - (4 \times 2 \times (-95))}}{2 \times 2}$$

$$a = 2 \quad b = 6 \quad c = -95$$

$$x = \frac{-6 \pm \sqrt{36 - (-760)}}{4}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-6 \pm \sqrt{36 + 760}}{4}$$

$$\text{either } x = \frac{-6 + \sqrt{796}}{4} = 5.55$$

$$x = \dots 5.55 \dots \text{ or } x = \dots -8.55 \dots$$

$$\text{or } x = \frac{-6 - \sqrt{796}}{4} = -8.55$$

(3)

Q1

(Total 6 marks)

2. Simplify fully

$$\frac{x^2 - 8x + 15}{2x^2 - 7x - 15}$$

$$\begin{aligned} &= \frac{(x-3)(\cancel{x-5})}{(\cancel{x-5})(2x+3)} \\ &= \frac{x-3}{2x+3} \end{aligned}$$

$$\begin{array}{r} \cancel{1} - 3 \\ \cancel{1} - 5 \\ -3 - 5 \end{array}$$

$$\begin{array}{r} \cancel{1} - 5 \\ \cancel{2} + 3 \\ -10 + 3 \end{array}$$

$$\frac{x-3}{2x+3}$$

(Total 3 marks)

Leave blank

Q2

3. (a) Show that the equation

$$\frac{5}{x+2} = \frac{4-3x}{x-1}$$

can be rearranged to give $3x^2 + 7x - 13 = 0$

cross multiply

$$(x+2)(4-3x) = 5(x-1)$$

$$4x - 3x^2 + 8 - 6x = 5x - 5$$

$$4x - 3x^2 + 8 - 6x - 5x + 5 = 0$$

$$-3x^2 - 7x + 13 = 0$$

$$3x^2 + 7x - 13 = 0$$

(3)

(b) Solve $3x^2 + 7x - 13 = 0$

Give your solutions correct to 2 decimal places.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a = 3 \quad b = 7 \quad c = -13$$

$$x = \frac{-7 \pm \sqrt{7^2 - (4 \times 3 \times (-13))}}{2 \times 3}$$

$$x = \frac{-7 \pm \sqrt{49 - (-156)}}{6}$$

$$\text{either } x = \frac{-7 + \sqrt{205}}{6} = 1.2196$$

$$\text{or } x = \frac{-7 - \sqrt{205}}{6} = -3.5529$$

$$x = 1.22 \text{ or } x = -3.55$$

(3)

Q3

(Total 6 marks)

Leave
blank

4. (a) Expand and simplify $(x + 3)(x - 4)$
 $= x^2 - 4x + 3x - 12$
 $= x^2 - x - 12$

..... $x^2 - x - 12$
 (2)

(b) Factorise $x^2 + 7x + 10$
 $(x + 2)(x + 5)$

..... $(x + 2)(x + 5)$
 (2)

(c) $p = 3t + 4(q - t)$

Find the value of q when $p = 6$ and $t = 5$

$6 = 15 + 4(q - 1)$
 $6 - 15 = 4q - 4$
 $6 - 15 + 4 = 4q$
 $-5 = 4q$
 $q = -\frac{5}{4}$
 $q = -1\frac{1}{4}$

$q = -1\frac{1}{4}$
 (3)

(Total 7 marks)

Q4

5. (a) Factorise $x^2 - 7x + 10$

$$\begin{array}{r} 1-2 \\ 1-5 \\ -2-5 \end{array}$$

$$\dots\dots\dots(x-2)(x-5)\dots\dots\dots$$

(2)

(b) Solve $x^2 - 7x + 10 = 0$

$$x - 2 = 0$$

$$x = 2$$

$$x - 5 = 0$$

$$x = 5$$

$$x = \dots\dots2\dots\dots\dots$$

$$\text{or } x = \dots\dots5\dots\dots\dots$$

(1)

(Total 3 marks)

Leave
blank

Q5

6. (a) Simplify $4a + 3c - 2a + c$

$$2a + 4c$$

$$\dots\dots\dots 2a + 4c \dots\dots\dots$$

(1)

(b) $S = \frac{1}{2}at^2$

Find the value of S when $t = 3$ and $a = \frac{1}{4}$

$$S = \frac{1}{2} \times \frac{1}{4} \times \frac{9}{1}$$

$$S = \frac{9}{8}$$

$$S = 1\frac{1}{8}$$

$$S = \dots\dots\dots 1\frac{1}{8} \dots\dots\dots$$

(2)

(c) Factorise $x^2 - 5x$

$$x(x - 5)$$

$$\dots\dots\dots x(x - 5) \dots\dots\dots$$

(2)

(d) Expand and simplify $(x + 3)(x + 4)$

$$x^2 + 4x + 3x + 12$$

$$x^2 + 7x + 12$$

$$\dots\dots\dots x^2 + 7x + 12 \dots\dots\dots$$

(2)

(e) Factorise $y^2 + 8y + 15$

$$(y + 3)(y + 5)$$

$$\dots\dots\dots (y + 3)(y + 5) \dots\dots\dots$$

(2)

(Total 9 marks)

Q6

Leave
blank

7 . (a) Simplify $(c^2 k^5)^4$

$$c^8 k^{20}$$

$$c^8 k^{20}$$

(1)

(b) Expand and simplify $(3x + 5)(4x - 1)$

$$12x^2 - 3x + 20x - 5$$

$$12x^2 + 17x - 5$$

$$12x^2 + 17x - 5$$

(2)

(c) Solve $x^2 - 3x - 10 = 0$

$$(x + 2)(x - 5) = 0$$

$$x = -2 \text{ or } 5$$

$$x = -2 \text{ or } 5$$

(3)

(Total 6 marks)

Q7

8 . The diagram below shows a large rectangle of length $(2x + 6)$ cm and width x cm.

A smaller rectangle of length x cm and width 3 cm is cut out and removed.

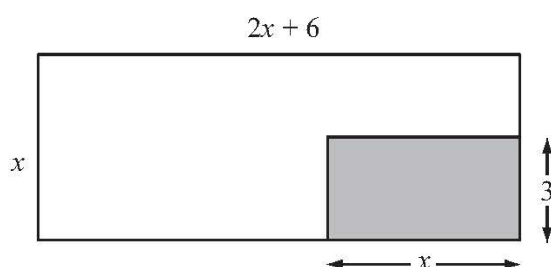


Diagram **NOT**
accurately drawn

The area of the shape that is left is 100 cm^2 .

(a) Show that $2x^2 + 3x - 100 = 0$

$$x(2x + 6) - 3x = 100$$

$$2x^2 + 6x - 3x = 100$$

$$2x^2 + 3x = 100$$

$$2x^2 + 3x - 100 = 0$$

(3)

(b) Calculate the length of the smaller rectangle.
Give your answer correct to 3 significant figures.

$$2x^2 + 3x - 100 = 0$$

$$a = 2 \quad b = 3 \quad c = -100$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-3 \pm \sqrt{9 - (4 \times 2 \times (-100))}}{2 \times 2}$$

$$x = \frac{-3 + \sqrt{9 - (-800)}}{4}$$

$$x = \frac{-3 + \sqrt{809}}{4}$$

$$x = 6.3607$$

.....6.36..... cm
(4)

Q8

(Total 7 marks)

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